Gunter, Jason

From: Nations, Mark [mnations@doerun.com]
Sent: Friday, April 12, 2013 12:12 PM
To: Gunter, Jason
Cc: England, Jason; Yingling, Mark; Wohl, Matthew; 'Kevin Lombardozzi' (kevinl@VALHI.NET); 'John E. Kennedy' (jkennedy@i1.net); Norman Lucas (cityhall@i1.net); robert.hinkson@dnr.mo.gov; Ty Morris (TMorris@barr.com)
Subject: National Mine Tailings Site Progress Report
Attachments: National.pdf; Teklab Lab Report 13030305_REV1_03-06-13.pdf

Jason:
Attached is the National Tailings Site progress report for the month of March 2013.
In an effort to reduce the amount of paper generated I am requesting to eliminate the hard copies. If anyone prefers or requires a hard copy in addition to the electronic, please let me know.
Thanks Mark

THE DOE RUN COMPANY

Remediation Group

Mark Nations
Mining Properties Manager
mnations@doerun.com

April 12, 2013

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
11201 Renner Blvd.
Lenexa, KS 66219

Re: National Mine Tailings Site Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 51 of the Unilateral Administrative Order (Docket No.CERCLA-07-2006-0231) for the referenced project and on behalf of The Doe Run Company and NL Industries, Inc., the progress report for the period March 1, 2013 through March 31, 2013 is enclosed. If you have any questions or comments, please call me 573-518-0800.

Sincerely,

Mark Nations
Mining Properties Manager

Enclosure
c: Jason England – TDRC
Mark Yingling – TDRC (electronic only)
Matt Wohl – TDRC (electronic only)
Kevin Lombardozzi – NL Industries, Inc.
John Kennedy – City of Park Hills
Norm Lucas – Park Hills – Leadington Chamber of Commerce
Robert Hinkson – MDNR
Ty Morris – Barr Engineering

National Mine Tailings Site
Park Hills, Missouri
Removal Action - Monthly Progress Report
Period: March 1, 2013 – March 31, 2013

1. **Actions Performed and Problems Encountered This Period:**

   a. Work continued on the development of the Removal Action Report.

2. **Analytical Data and Results Received This Period:**

   a. During this period, water samples were collected at the sampling locations identified in Appendix C of the Removal Action Work Plan where water was present. Copies of the analytical results from the last sampling event are included with this progress report.

   b. During this period, the Ambient Air Monitoring Reports for December 2012 and Fourth Quarter 2012 were completed. Any issues identified in these reports are discussed below. A copy of these documents has been sent to your attention.

   The December 2012 Ambient Air Monitoring Report noted the following:
   - The action levels for lead and dust were not exceeded.
   - The sample for National #1 (Ozark Insulation) TSP monitor on 12/06/12 was qualified because the reweigh value was outside laboratory tolerances. The lead concentration was not affected by this issue.
   - The sample for National #2 (Soccer Field) TSP monitor on 12/20/12 was invalid since the elapsed time for the sample exceeded tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
   - The sample for National #3 (Water Plant) TSP monitor on 12/20/12 was invalid due to a mechanical failure. Upon discovering the mechanical failure, the issue was addressed.
   - No samples were taken with the TSP monitors on 12/24/12 and 12/25/12 due to the holiday.
   - No samples were taken with the PM_{10} monitors on 12/26/12 due to the holiday.
   - A QA filter blank was completed on the Big River #4 (Primary) TSP and PM_{10} monitors on 12/28/12.

   The Fourth Quarter 2012 Ambient Air Monitoring Report noted the following:
   - The action levels for lead and dust were not exceeded.
   - No sample was taken with the Big River #4 (Primary) PM_{10} monitor on 10/09/12 due to mechanical failure of the elapsed time indicator. Upon discovery, the issue was corrected.
   - No sample was taken with the Big River #4 (Primary) TSP monitor on 11/02/12 due to the filter being compromised by moisture during a storm event. Upon discovery, the issue was corrected.
   - The sample for Big River #4 (QA) PM_{10} monitor was invalid on 11/05/12 due to the elapsed run time exceeding tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
   - No samples were taken with the TSP and PM_{10} monitors on 11/21/12, 11/22/12, and 11/23/12 due to the holiday.
   - A QA filter blank was completed on the Rivermines #3 (Water Treatment Plant) TSP and PM_{10} monitors on 11/27/12.
   - The sample for National #1 (Ozark Insulation) TSP monitor on 12/06/12 was qualified because the reweigh value was outside laboratory tolerances. The lead concentration was not affected by this issue.
   - The sample for National #2 (Soccer Field) TSP monitor on 12/20/12 was invalid since the elapsed time for the sample exceeded tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
   - The sample for National #3 (Water Plant) TSP monitor on 12/20/12 was invalid due to a mechanical failure. Upon discovering the mechanical failure, the issue was addressed.
   - No samples were taken with the TSP monitors on 12/24/12 and 12/25/12 due to the holiday.
   - No samples were taken with the PM_{10} monitors on 12/26/12 due to the holiday.

- A QA filter blank was completed on the Big River #4 (Primary) TSP and PM_{10} monitors on 12/28/12.

3. Developments Anticipated and Work Scheduled for Next Period:

a. Complete work in the Mine Shaft Area.

b. Continue developing the Removal Action Report.

c. Complete monthly water sampling activities as described in the Removal Action Work Plan.

d. Complete air monitoring activities as described in the Removal Action Work Plan.

4. Changes in Personnel:

a. None.

5. Issues or Problems Arising This Period:

a. None.

6. Resolution of Issues or Problems Arising This Period:

a. None.

End of Monthly Progress Report

March 26, 2013

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109
TEL: (573) 638-5007
FAX: (573) 638-5001

RE: National Tailings Pile - Design and Construction **WorkOrder:** 13030305

Dear Allison Olds:

TEKLAB, INC received 2 samples on 3/7/2013 9:40:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael L. Austin
Project Manager
(618)344-1004 ex 16
MAustin@teklabinc.com

Client: Barr Engineering Company
Client Project: National Tailings Pile - Design and Construction

Work Order: 13030305
Report Date: 26-Mar-13

This reporting package includes the following:

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

Abbr Definition

CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
DNI	Did not ignite
DUP	Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MB	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TNTC	Too numerous to count (> 200 CFU)

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- E - Value above quantitation range
- H - Holding times exceeded
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- X - Value exceeds Maximum Contaminant Level

Client: Barr Engineering Company

Work Order: 13030305

Client Project: National Tailings Pile - Design and Construction

Report Date: 26-Mar-13

Cooler Receipt Temp: 2.2 °C

This report was revised on 03/26/2013 per Andrea Nord's request. The reason for the revision is remove the Soil Method Blank (R174806 MBLK 130311) from the QC section of the final report. Please replace report dated 03/15/2013 with this report. MLA 03/26/2013

Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	KKlostermann@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2014	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2014	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2014	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		5/26/2013	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13
Lab ID: 13030305-001
Client Sample ID: Nat-East
Matrix: AQUEOUS
Collection Date: 03/06/2013 12:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	200		**297**	mg/L	20	03/14/2013 13:07	R174806
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**8.04**		1	03/07/2013 11:30	R174494
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**530**	mg/L	1	03/07/2013 16:17	R174563
STANDARD METHODS 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		**612**	mg/L	1	03/11/2013 18:30	R174691
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	03/07/2013 12:14	R174527
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.2		**< 0.2**	ml/L	1	03/07/2013 11:20	R174526
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**1.0**	mg/L	1	03/08/2013 18:18	R174603
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	03/07/2013 17:07	86290
Zinc	NELAP	10.0		**186**	µg/L	1	03/07/2013 17:07	86290
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	03/08/2013 19:08	86286
Zinc	NELAP	10.0		**217**	µg/L	1	03/08/2013 19:08	86286
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	**6.60**	µg/L	1	03/08/2013 11:36	86285
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**4.83**	µg/L	1	03/07/2013 14:11	86288

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13
Lab ID: 13030305-002
Client Sample ID: Nat-NW
Matrix: AQUEOUS
Collection Date: 03/06/2013 12:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	20		**43**	mg/L	2	03/12/2013 17:59	R174694
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**8.41**		1	03/07/2013 11:32	R174494
STANDARD METHODS 2340 C								
Hardness, as (CaCO3)	NELAP	5		**200**	mg/L	1	03/07/2013 16:17	R174563
STANDARD METHODS 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		**166**	mg/L	1	03/11/2013 18:31	R174691
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	03/07/2013 12:14	R174527
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.2		**< 0.2**	ml/L	1	03/07/2013 11:20	R174526
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**< 1.0**	mg/L	1	03/08/2013 18:43	R174603
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	03/07/2013 17:13	86290
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	03/07/2013 17:13	86290
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	03/08/2013 19:14	86286
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	03/08/2013 19:14	86286
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**2.94**	µg/L	1	03/08/2013 11:47	86285
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	03/07/2013 14:22	86288

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
13030305-001	Nat-East	Aqueous	5	03/06/2013 12:00
13030305-002	Nat-NW	Aqueous	5	03/06/2013 12:25

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
13030305-001A	Nat-East	03/06/2013 12:00	03/07/2013 9:40		
	Standard Methods 2540 C (Total)				03/11/2013 18:30
	Standard Methods 2540 D				03/07/2013 12:14
	Standard Methods 2540 F				03/07/2013 11:20
13030305-001B	Nat-East	03/06/2013 12:00	03/07/2013 9:40		
	EPA 600 375.2 Rev 2.0 1993 (Total)				03/14/2013 13:07
	Standard Method 4500-H B, Laboratory Analyzed				03/07/2013 11:30
	Standard Methods 2340 C				03/07/2013 16:17
13030305-001C	Nat-East	03/06/2013 12:00	03/07/2013 9:40		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			03/07/2013 11:30	03/08/2013 19:08
	Standard Methods 3030 E, 3113 B, Metals by GFAA			03/07/2013 11:11	03/08/2013 11:36
13030305-001D	Nat-East	03/06/2013 12:00	03/07/2013 9:40		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			03/07/2013 12:23	03/07/2013 17:07
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			03/07/2013 11:48	03/07/2013 14:11
13030305-001E	Nat-East	03/06/2013 12:00	03/07/2013 9:40		
	Standard Methods 5310 C, Organic Carbon				03/08/2013 18:18
13030305-002A	Nat-NW	03/06/2013 12:25	03/07/2013 9:40		
	Standard Methods 2540 C (Total)				03/11/2013 18:31
	Standard Methods 2540 D				03/07/2013 12:14
	Standard Methods 2540 F				03/07/2013 11:20
13030305-002B	Nat-NW	03/06/2013 12:25	03/07/2013 9:40		
	EPA 600 375.2 Rev 2.0 1993 (Total)				03/12/2013 17:59
	Standard Method 4500-H B, Laboratory Analyzed				03/07/2013 11:32
	Standard Methods 2340 C				03/07/2013 16:17
13030305-002C	Nat-NW	03/06/2013 12:25	03/07/2013 9:40		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			03/07/2013 11:30	03/08/2013 19:14
	Standard Methods 3030 E, 3113 B, Metals by GFAA			03/07/2013 11:11	03/08/2013 11:47
13030305-002D	Nat-NW	03/06/2013 12:25	03/07/2013 9:40		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			03/07/2013 12:23	03/07/2013 17:13
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			03/07/2013 11:48	03/07/2013 14:22
13030305-002E	Nat-NW	03/06/2013 12:25	03/07/2013 9:40		
	Standard Methods 5310 C, Organic Carbon				03/08/2013 18:43

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R174694 **SampType:** MBLK Units mg/L
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**< 10**						03/12/2013

Batch R174694 **SampType:** LCS Units mg/L
SampID: LCS SO4

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**29**	27	0	107.6	90	110	03/12/2013

Batch R174806 **SampType:** MBLK Units mg/L
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**< 10**						03/14/2013

Batch R174806 **SampType:** LCS Units mg/L
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**20**	20	0	100.9	90	110	03/14/2013

Batch R174806 **SampType:** MS Units mg/L
SampID: 13030305-001BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	200		**482**	200	296.6	92.9	90	110	03/14/2013

Batch R174806 **SampType:** MSD Units mg/L RPD Limit **10**
SampID: 13030305-001BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate	200		**484**	200	296.6	93.4	482.5	0.21	03/14/2013

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R174494 **SampType:** LCS Units
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH	1.00		**7.01**	7.00	0	100.1	99.1	100.8	03/06/2013

Batch R174494 **SampType:** DUP Units RPD Limit **10**
SampID: 13030305-001B DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**8.04**				8.040	0.00	03/07/2013

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R174494 **SampType:** DUP Units RPD Limit 10
SampID: 13030305-002B DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**8.43**				8.410	0.24	03/07/2013

STANDARD METHODS 2340 C

Batch R174563 **SampType:** MBLK Units mg/L
SampID: MB-R174563

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**< 5**						03/07/2013

Batch R174563 **SampType:** LCS Units mg/L
SampID: LCS-R174563

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**1020**	1000	0	102.0	90	110	03/07/2013

Batch R174563 **SampType:** MS Units mg/L
SampID: 13030305-001BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Hardness, as (CaCO3)	5		**750**	200	530.0	110.0	85	115	03/07/2013

Batch R174563 **SampType:** MSD Units mg/L RPD Limit 10
SampID: 13030305-001BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Hardness, as (CaCO3)	5		**720**	200	530.0	95.0	750.0	4.08	03/07/2013

STANDARD METHODS 2540 C (TOTAL)

Batch R174691 **SampType:** MBLK Units mg/L
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids	20		**< 20**						03/12/2013
Total Dissolved Solids	20		**< 20**						03/11/2013
Total Dissolved Solids	20		**< 20**						03/12/2013
Total Dissolved Solids	20		**< 20**						03/11/2013
Total Dissolved Solids	20		**< 20**						03/11/2013

Batch R174691 **SampType:** LCS Units mg/L
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids	20		**1010**	1000	0	101.4	90	110	03/11/2013

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

STANDARD METHODS 2540 C (TOTAL)

Batch R174691 **SampType:** LCSQC Units **mg/L**
SampID: LCSQC

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids	20		**1010**	1000	0	101.4	90	110	03/11/2013
Total Dissolved Solids	20		**1020**	1000	0	101.6	90	110	03/11/2013
Total Dissolved Solids	20		**1000**	1000	0	100.4	90	110	03/12/2013
Total Dissolved Solids	20		**1060**	1000	0	105.8	90	110	03/12/2013

Batch R174691 **SampType:** MS Units **mg/L**
SampID: 13030305-001AMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Dissolved Solids	20		**1150**	500	612.0	106.8	85	115	03/11/2013

Batch R174691 **SampType:** MSD Units **mg/L** RPD Limit **15**
SampID: 13030305-001AMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Dissolved Solids	20		**1150**	500	612.0	107.6	1146	0.35	03/11/2013

STANDARD METHODS 2540 D

Batch R174527 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**< 6**						03/07/2013

Batch R174527 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**99**	100	0	99.0	85	115	03/07/2013
Total Suspended Solids	6		**101**	100	0	101.0	85	115	03/07/2013
Total Suspended Solids	6		**103**	100	0	103.0	85	115	03/07/2013
Total Suspended Solids	6		**95**	100	0	95.0	85	115	03/07/2013
Total Suspended Solids	6		**101**	100	0	101.0	85	115	03/07/2013

Batch R174527 **SampType:** DUP Units **mg/L** RPD Limit **15**
SampID: 13030305-001A DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Suspended Solids	6		**< 6**				0	0.00	03/07/2013

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R174603 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**< 1.0**						03/08/2013

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R174603 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	10.0		**61.4**	59.7	0	102.9	90	110	03/08/2013

Batch R174603 **SampType:** MS Units **mg/L**
SampID: 13030305-001EMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**5.5**	5.0	1.040	89.8	85	115	03/08/2013

Batch R174603 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 13030305-001EMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Organic Carbon (TOC)	1.0		**5.4**	5.0	1.040	87.6	5.530	2.01	03/08/2013

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch 86290 **SampType:** MBLK Units **µg/L**
SampID: MB-86290

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	03/07/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	03/07/2013

Batch 86290 **SampType:** LCS Units **µg/L**
SampID: LCS-86290

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**46.5**	50.0	0	93.0	85	115	03/07/2013
Zinc	10.0		**458**	500	0	91.7	85	115	03/07/2013

Batch 86290 **SampType:** MS Units **µg/L**
SampID: 13030305-002DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**45.8**	50.0	0	91.6	75	125	03/07/2013
Zinc	10.0		**456**	500	3.4	90.6	75	125	03/07/2013

Batch 86290 **SampType:** MSD Units **µg/L** RPD Limit **20**
SampID: 13030305-002DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**45.4**	50.0	0	90.8	45.8	0.88	03/07/2013
Zinc	10.0		**454**	500	3.4	90.1	456.5	0.62	03/07/2013

Client: Barr Engineering Company

Work Order: 13030305

Client Project: National Tailings Pile - Design and Construction

Report Date: 26-Mar-13

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 86286 **SampType:** MBLK Units µg/L
SampID: MB-86286

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	03/08/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	03/08/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	03/12/2013

Batch 86286 **SampType:** LCS Units µg/L
SampID: LCS-86286

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**51.1**	50.0	0	102.2	85	115	03/08/2013
Zinc	10.0		**510**	500	0	101.9	85	115	03/08/2013
Zinc	10.0		**489**	500	0	97.8	85	115	03/12/2013

Batch 86286 **SampType:** MS Units µg/L
SampID: 13030305-002CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**49.6**	50.0	0	99.2	75	125	03/08/2013
Zinc	10.0		**500**	500	2.1	99.6	75	125	03/08/2013

Batch 86286 **SampType:** MSD Units µg/L RPD Limit **20**
SampID: 13030305-002CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**49.7**	50.0	0	99.4	49.6	0.20	03/08/2013
Zinc	10.0		**504**	500	2.1	100.3	500	0.74	03/08/2013

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 86285 **SampType:** MBLK Units µg/L
SampID: MB-86285

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	03/08/2013

Batch 86285 **SampType:** LCS Units µg/L
SampID: LCS-86285

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**15.6**	15.0	0	103.9	85	115	03/08/2013

Batch 86285 **SampType:** MS Units µg/L
SampID: 13030305-001CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**20.5**	15.0	6.6023	92.5	70	130	03/08/2013

Client: Barr Engineering Company

Work Order: 13030305

Client Project: National Tailings Pile - Design and Construction

Report Date: 26-Mar-13

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 86285 **SampType:** MSD Units µg/L RPD Limit 20

SampID: 13030305-001CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		**20.1**	15.0	6.6023	89.8	20.4837	2.04	03/08/2013

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 86288 **SampType:** MBLK Units µg/L

SampID: MB-86288

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	03/07/2013

Batch 86288 **SampType:** LCS Units µg/L

SampID: LCS-86288

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**15.3**	15.0	0	101.9	85	115	03/07/2013

Batch 86288 **SampType:** MS Units µg/L

SampID: 13030305-001DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**18.0**	15.0	4.8339	87.6	70	130	03/07/2013

Batch 86288 **SampType:** MSD Units µg/L RPD Limit 20

SampID: 13030305-001DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		**18.3**	15.0	4.8339	90.0	17.9697	2.03	03/07/2013

Teklab Inc
Environmental Laboratory

Receiving Check List

http://www.teklabinc.com/

Client: Barr Engineering Company
Work Order: 13030305
Client Project: National Tailings Pile - Design and Construction
Report Date: 26-Mar-13

Carrier: Tim Mathis
Received By: SRH

Completed by: Emily E. Pohlman
On: 07-Mar-13

Reviewed by: Michael L. Austin
On: 07-Mar-13

Pages to follow: Chain of custody 1 Extra pages included 0

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐		Temp °C	2.2	
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐		Dry Ice	☐	
Chain of custody present?	Yes ☑	No ☐					
Chain of custody signed when relinquished and received?	Yes ☑	No ☐					
Chain of custody agrees with sample labels?	Yes ☑	No ☐					
Samples in proper container/bottle?	Yes ☑	No ☐					
Sample containers intact?	Yes ☑	No ☐					
Sufficient sample volume for indicated test?	Yes ☑	No ☐					
All samples received within holding time?	Yes ☑	No ☐					
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐				
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐					

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials	☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers	☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐		
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA	☑

Any No responses must be detailed below or on the COC.

13030305

Chain of Custody

BARR
1001 Diamond Ridge, Suite 1100
Jefferson City, MO 65109
(573) 638-5000

Project Number: 25860003.06 TLM2 030

Project Name: National Tailings Pile - Design and Construction

Sample Origination State: MO (use two letter postal state abbreviation)

COC Number: NAT 030613

COC 1 of 1

Project Manager: Ty Morris

Project QC Contact: Andrea Nord

Sampled By: Stephen Moilanen

Laboratory: Teklab

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Matrix	Type: Grab	Type: Comp	Type: QC	Parameters: Water: pH	Total Suspended Solids	Sulfate	Settleable Solids	Total Organic Carbon	Total Metals	Dissolved Metals	Hardness	Total Dissolved Solids	Soil							Total Number of Containers	Preservatives
1. Nat-East	B030305-001			03/06/13	12:00	X			X			X	X	X	X	X	X	X	X	X								5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
2. Nat. NW		-002		3/6/13	12:25	X			X			X	X	X	X	X	X	X	X	X								5	"
3.																													
4.																													
5.																													
6.																													
7.																													
8.																													

Comments: Invoice to Mark Nations at Doe Run. Results to be sent to Allison Olds (aolds@barr.com) at Barr Engineering, Andrea Nord (anord@barr.com) at Barr Engineering, and Mark Nations (mnations@doerun.com) at Doe Run.
Matrix is surface water.
Metals include Cadmium, Lead, and Zinc.

Common Parameter/Container – Preservation Key

#1 – Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 – Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide, PCBs
#3 – General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 – Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: Stephen Moilanen	On Ice? ☒Y ☐N	Date: 3-6-13	Time: 16:00	Received by:	Date: 3-7-13	Time: 0800
Relinquished By:	On Ice? ☒Y ☐N	Date: 3-7-13	Time: 0840	Received by: Stephanie Hayes	Date: 3/7/13	Time: 9:40
Samples Shipped VIA: ☐Air Freight ☐Federal Express ☐Sampler ☒Other: Courier				Air Bill Number:		

Distribution: White – Original Accompanies Shipment to Lab; Yellow – Field Copy; Pink – Lab Coordinator

2.2°C Temp Cooler #2
PRESERVED in field TMB

C:\Users\sbm\Desktop\Doe Run Chains\Chain of Custody Nat.doc